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USSR: Economics of the Siberia-to-Europe Gas Pipeline

The Siberia-to-Europe natural gas pipeline is of considerable importance to the USSR even though it would be a marginal project if evaluated by Western standards of profitability. With oil exports to the West likely to disappear in the next few years, Moscow has no prospective exports other than gas to increase or even maintain hard currency revenues.

If, as seems likely, Soviet gas sells at roughly parity with the price of residual fuel oil, the pipeline would earn a profit at the wellhead only if the rates of return on Soviet capital were fairly low. From the Soviet viewpoint, however, the pipeline is vitally necessary. Moreover, the Western goods purchasable with the project's earnings are worth far more to the Soviet economy than are the goods producible with the Soviet resources used to build and operate the pipeline. Finally, the gas to be shipped through the pipeline could not be used domestically for several years because of inadequate capacity of distribution pipelines.

Project Profitability

the likely softening in West European gas demand for the 1980s will force the pipeline's gas to sell at near parity with the price of residual fuel oil, roughly \$4 per 1,000 cubic feet (f.o.b. West Germany). Under several assumptions about overruns on Soviet construction costs and rates of return on Soviet capital,² however, the

Alternative assumed cost overruns—increased construction costs net of inflation—were 0, 25, and 50 percent. Alternative rates of return on capital were 12, 15, and 20 percent per year.

USSR: Natural Gas Exports to Western Europe *

	1980	1985 *	1990	
				One Line * Twin Line *
Billion cubic feet per day	2.1	2.4	5.3	7.0
Million b/d oil equivalent	0.4	0.4	0.9	1.2

- * Excluding Finland.
- * Existing contracts only.
- * Assumes 2.9 billion cubic feet per day under one-line project.
- * Assumes 4.6 billion cubic feet per day under twin-line project.

project's breakeven price—which equates the pipeline's discounted 20-year streams of revenues and costs—is much higher than \$4. Only with a return on equity of 12 percent—much lower than that expected from similar projects in the West—and cost overruns of no more than 25 percent would the pipeline earn a profit.

Algerian gas, the largest alternative natural gas source for Western Europe during the 1980s, is probably deliverable—either by pipeline or LNG projects—more cheaply than Siberian gas. At \$4 per 1,000 cubic feet, either Algerian project would earn a profit. Moscow, on the other hand, has been seeking a price (f.o.b. West Germany) near parity with crude oil, roughly \$6 per 1,000 cubic feet. Only at that price, would the Siberian project earn a profit at current Western rates of return.

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**USSR: Hard Currency Cash Flow
for the Siberian Pipeline^b**

Billion US \$

	1982-85	1986-87	1988-93	1994 ^c
Debt service ^d	-2.4	-3.5	-6.9	0
Revenues ^e	0	15.8	70.0	16.0
Cash flow	-2.4	12.3	63.1	16.0

^a In current prices, assuming 10-percent annual rate of inflation.

^b Cumulative flows for each of the multiyear periods shown.

^c Project will continue through the year 2006.

^d Interest payments begin in 1982; repayment of principal starts in 1985.

^e Assumes gas deliveries begin in 1986 at full capacity of 2.9 billion cubic feet per day.

The Soviet Perspective

The export pipeline project would be attractive to Moscow, however, even if it appeared marginal in terms of Western profitability accounting. Most important, the pipeline is the Soviets' largest prospective source of stable hard currency earnings. Increased sales of alternative goods, even if feasible, would produce less revenues than gas:

- Exports of gold, nickel, and platinum group metals, for example, could be increased for less cost than building the pipeline, and their combined earnings could approximate those from the single-line project if existing world market prices held firm. The Soviets' already large share of those metals markets, however, would probably cause increased Soviet supply to depress prices substantially, reducing revenues further for each increment in exports. The West European gas market, on the other hand, is probably large enough to absorb the single line's deliveries at a price roughly equivalent to that of residual fuel oil.
- Increased Soviet exports of most other raw materials and of manufactured goods—including weapons—would encounter more rapidly rising costs than would gas exports and would achieve a

**USSR: Hard Currency Earnings
From Gas Exports**

Billion 1980 US \$

	1980	1985 ^a	1990 ^c	
			One Line	Twin Line
Total earnings	3.0	3.5	7.7	10.2
Pipeline earnings	0	0	4.2	6.7

^a At \$4 per thousand cubic feet, except for 1980.

^b Existing contracts only.

^c Full deliveries from single-line project assumed to begin in 1986; deliveries under a twin-line project probably would start only by 1987-88.

smaller net growth in revenue. Returns on investment in many Soviet extractive industries are falling faster than they are for gas. In manufactures, an improvement in the quality of export-oriented goods necessary to achieve an increase in hard currency revenues equal to that from the pipeline project would probably require more investment than the pipeline itself.

Conversely, the costs to Moscow of not concluding a pipeline deal are high. Although hard currency earnings from a one-line project probably would be about 60 percent of that from a twin-line deal, they would still be substantial. Moreover, since the pipeline's hard currency costs could be repaid within two to three years after startup, most of the project's subsequent revenue could go for imports. With oil exports to the West probably disappearing by the mid-1980s, lack of a pipeline deal would mean a substantial drop in Soviet import capacity. By the late 1980s, total gas hard currency earnings with the pipeline in operation would equal one-half of the 1980 revenues from oil; without the pipeline they would equal only one-fourth. The revenues foregone, moreover, would most likely have purchased machinery and other manufactured goods, whose marginal productivity exceeds that of similar items produced domestically.

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USSR: Hard Currency
Gas Exports as a Share of the
Value of 1980 Oil Exports *

Percent

1980	1985 *	1990 *	
		One Line	Twin Line
21	24	53	70

* Soviet oil exports for hard currency only, which totaled \$14.5 billion. Gas hard currency revenues in constant 1980 dollars, at \$4.00 per 1,000 cubic feet.

* Assumes only deliveries under existing contracts.

* Existing contracts plus deliveries under Siberian pipeline project.

The pipeline project would also involve Western Europe more heavily in Siberian development. Aside from potential political benefits, the Soviets would be able to increase the amount of capital available for investment in Siberian energy at a time when Soviet resources are being stretched thin between the massive Siberian oil drilling program and the unprecedented domestic gas pipeline construction effort.

Low Gas Opportunity Cost

The gas destined for export under a single-line deal could not be used domestically for some years. An inadequate grid of gas distribution lines will prevent a vast number of oil-consuming industries and homes from switching to gas and thus absorbing the entire planned increase in gas output.* Canceling the export line's construction would not free up enough resources to accelerate expansion of the distribution grid. Moreover, even if the Siberian deal did not go through, Moscow could not provide any more gas for internal use without building a domestic trunkline of almost equal length.

* Gas-for-oil substitution will also be constrained by the substantially increased use of internal combustion engines—notably in automotive transport and in agriculture.